

CALIFORNIA ENVIRONMENTAL QUALITY ACT NOTICE OF EXEMPTION

To: Office of Planning and Research
State Clearinghouse
P.O. Box 3044, 1400 Tenth Street, Room 212
Sacramento, CA 95812-3044

From: Department of Toxic Substances Control
Safer Products & Workplaces Program
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Project Title: Hazardous Materials: Motor Vehicle Brake Friction Materials (Regulation Reference Number R-2014-01)

Project Location: Statewide

County:

Project Description:

The proposed project is a statewide rulemaking that would set regulatory requirements for analytical laboratory testing of brake friction materials (also known as brake pads)¹, as well as marking and certification of brake friction materials sold in the State of California. The proposed regulation also establishes the requirements that manufacturers must follow when requesting an extension to the 2025 requirements in Health and Safety Code section 25250.53.

This exemption does not precede site or project specific decisions or actions. Ongoing or reasonably foreseeable actions required by the proposed project are independent and do not share common geography. For example, the chemical analysis of brake friction material may occur in New Jersey or Michigan, certification in Michigan, and marking in China or other countries. Generally, brake friction materials are manufactured, chemically tested, marked, and certified outside of California.

Background:

Existing Regulatory Setting - The Brake Friction Material Law

Starting in 2014, California law² requires brake friction formulations sold in the state have limited concentrations of cadmium, chromium, lead, mercury, and asbestiform fibers. Furthermore, the law³ requires that vehicle brake friction manufacturers reduce the level of copper in brake friction formulations in two phases. To replace copper, manufacturers would be required to conduct a screening of potential alternatives to the use of copper that consider the fate of brake friction materials in the environment and their emissions through all phases of the brake friction material life cycle.

The Governor approved Senate Bill 346 on September 10, 2010 and enacted Health and Safety Code (HSC) sections 25250 et seq. and DTSC is responsible for implementing this statute. The law prohibits the sale of any motor vehicle brake friction materials containing specified constituents in amounts that exceed certain concentrations. Commencing January 1, 2021, the law prohibits motor vehicle brake friction materials containing more than 5.0% copper by weight from being sold in the state, and, commencing on January 1, 2025, prohibits motor vehicle brake friction materials exceeding 0.5% copper by weight from being sold in the state.

The law exempts brake friction materials used on certain motor vehicle classes from its requirements and exempts brake friction materials manufactured for vehicles produced prior to certain dates. Examples of some of the exemptions include brake friction material for motorcycles, military support vehicles, and vehicles produced by small volume manufacturers.

Manufacturers of vehicle brake friction material are required to screen potential alternatives to copper using the existing Toxics Information Clearinghouse and to use an open source alternatives assessment or a screening analysis to select alternatives to copper that pose less potential hazard to public health and the environment. Upon request, the vehicle brake friction material manufacturer or the importer of record is required to provide DTSC with a summary of the

¹ "brake friction material" means that part of a motor vehicle brake designed to retard or stop the movement of a motor vehicle through friction against a rotor made of a more durable material.

"environmental compliance mark" means a three character alphanumeric identification code. The first code is either an "A", "B", or "N" and the second and third characters correspond to the year the material was manufactured.

"brake friction material business" means any brake manufacturer, motor vehicle manufacturer, automobile dealership, automobile parts distributor, retail store, or repair shop that make, produce, assemble, import, distribute, or sell brake friction material.

² Health and Safety Code sections 25250.51, 25250.52, and 25250.53

³ Health and Safety Code section 25250.56

alternatives screening. As copper is reduced or eliminated in brake friction material, the intent of the screening is to select alternatives to copper that pose less potential hazard to public health and the environment.

Furthermore, the law requires manufacturers to certify compliance that brake friction materials offered for sale in California meet the restrictions for brake friction material described above. The manufacturers must include a mark proof of certification on all brake friction materials and are required to obtain a copy of the certification from a testing certification agency.

General Statewide Setting

A wide variety of brake friction material businesses and individual households statewide may purchase brake pads and use on passenger vehicles, commercial vehicles and other motor vehicles. Statewide, significant quantities are bought annually. It is estimated that one out of 7 cars need to replace and install new brakes every year and it is estimated that the equivalent of about 30 million⁴ brake pads per year in California.

Many vehicles in North America have been engineered and developed to use ceramic type pads which contain copper. In order to meet the requirements of the new California law, the brake friction manufacturing industry has or will reformulate in order to meet the lower requirements of 5.0% copper by 2021 in California. During the research and development phase, one new brake friction formula will go through six or more development cycles before reaching completion. Each development cycle usually takes six to eight months.

Brake friction manufacturers can be categorized as either the original equipment manufacturer (OEM) or the aftermarket parts manufacturers. Global automobile manufacturers use OEM's components in the production of their assembled vehicles. These component parts are marketed under the automobile company's brand name, not the OEM brand. The aftermarket part manufacturer makes parts designed to function the same as the original parts and are sold under their own brand names which may also be the OEM. Most independent vehicle repair shops use aftermarket parts. This can mean that an OEM parts on one car model, can be an aftermarket part on another model.

The eight major original equipment brake friction material manufacturers each own 25-35 registered brake friction formulations. In addition, there are another 70 plus brake friction material suppliers in the aftermarket. Most brake friction material manufacturers are located outside of the United States. In California, there is only one brake friction business identified as a manufacturer of brake friction material. This manufacturer produces motorcycle brake friction material which is exempt under HSC section 25250.55. The other California businesses that are downstream handlers of brake friction material or brake pads are importers, distributors, retailers, fleet operators, and vehicle repair businesses.

The proposed project requires manufacturers to have their brake friction material certified by a testing certification agency (a.k.a., registrar). To date, the only registrar identified by the industry is NSF International. There are currently three laboratories accredited to complete the analytical laboratory procedure required to comply with the proposed project. The three analytical laboratories are EMSL Analytical, Inc. in Cinnaminson, New Jersey, Link Engineering Company – Chemical Laboratory in Dearborn, Michigan and NSF International in Ann Arbor, Michigan.

Brake Friction Material

Brake friction material is very complex and formulations vary tremendously. Brake friction material generally consists of four main components: binders, fibers, fillers, and modifiers. Various modified phenol-formaldehyde resins are used as the binders. Fibers were classified as metallic, mineral, ceramic, aramid, or potassium titanate. Fillers tend to be low-cost materials such as barium and antimony sulfate, kaolin clays, magnesium and chromium oxides, or metal powders. Friction modifiers can be of organic, inorganic or metallic composition. Graphite is a major modifier used to influence friction, but other modifiers include cashew dust, ground rubber and carbon black.

The chemical composition of the brake friction material as manufactured may significantly differ from brake wear debris. During use, the composition is often modified due to the high temperatures and pressures reached during the braking process. Elemental analysis of the wear debris, also known as fugitive emissions⁵ reveals a consistent presence of the elements iron, copper, and barium, and elemental concentrations varied.

⁴ Air Resources Board's vehicle population (aggregated) estimate is 26.5 million based on EMFAC 2011. If brake pads are replaced every seven years and there are eight brake pads per vehicle, the estimate of brake pads replaced every year is about 30 million.

⁵ Fugitive emissions are not caught by a capture system. Fugitive emissions can include dust emissions, such as particulate matter or solid particles suspended in the air by wind action and human activities that has not come out of a vent or a stack.

Need for Regulatory Requirements

Copper is an elemental metal that is regulated to protect aquatic life. Copper and other trace elements are essential for biological activity and become detrimental only when geologic or anthropogenic sources exceed concentrations beyond ranges typical of the natural habitat of specific aquatic species.

Copper as copper fiber, copper powder, brass fiber, and bronze powder is used to manufacture many brake friction material formulations used in brake pads. Under normal consumer use, brake pads wear down while cars are driven on roads, and wear debris is released into the air and onto roadway surfaces. Brake wear debris or fugitive dust includes particles that can range from less than 1 micrometers (μm) in diameter to greater than 100 μm . This wear debris may eventually end up in surface water bodies, if transported in runoff during precipitation events into the environment. Copper has low solubility, which enables it to persist in the environment for years. Toxic copper levels damage marine and freshwater organisms.

Objectives

The objectives of the proposed project are to reduce heavy metals and other pollutants in storm water runoff from roads and highways by promoting and facilitating the phase out of copper and its compounds and restrict the use of heavy metals in motor vehicle brake friction materials. Debris from brake pads is one source of these pollutants in storm water discharges, and reducing or eliminating the use of these compounds at the source has the potential to reduce water pollution from these discharges.

Project Activities:

The proposed project is a regulation, that if adopted, provide specificity for implementing the law and clarify the standards for analytical laboratory testing, marking brake pads, certifying brake pads to ensure compliance with the statute, and providing a process to apply for an extension to the 2025 requirements of the law. The provisions of the proposed regulation includes the following:

- Definitions
- References that are incorporated into the standards:
 - International Organization for Standardization's ISO/IEC 17025 and ISO/IEC 17065;
 - National Environmental Laboratory Accreditation Conference's NELAP Institute Standard; and
 - Society of Automotive Engineers' SAE J 866:2012 and SAE J 2975:2013.
- Self-certification of compliance procedures for manufacturers:
 - Submittal of samples to laboratory;
 - Confirmation that brake friction material meets Health and Safety Code requirements;
 - A signed statement declaring that all material are of the same composition;
 - Verification that there is a public postings of the certification; and
 - Marking brake friction material with proof of certification.
- Testing certification agency requirements:
 - Agency must ensure
 - analytical chemical laboratories are accredited;
 - approved testing methodologies were used;
 - certificates of compliance are issued;
 - all certificates are published on Internet;
 - all mark of proof are posted; and
 - appropriate environmental compliance mark are assigned; and
 - Agency must obtain DTSC approval.
- Certification procedure for laboratories performing the analytical chemical analysis:
 - Laboratories must meet ISO/IEC 17025;
 - Laboratories must meet NELAP;
 - Laboratories must meet California's Environmental Laboratory Accreditation Program; or
 - Laboratory may request approval for an alternative accreditation
- Analytical chemical testing methodology:
 - Laboratories must use SAE J2975; or
 - Laboratories may request approval for an alternative testing methodology.
- Proof of certification and the marking requirements for products:
 - Manufacturers must use SAE J866 to mark product; and
 - Manufacturers must mark product packaging with testing certification agency logo.
- Environmental compliance marking scheme:

- Brake pads must be marked with an "A", "B", or "N" and use two digits to represent the year.
- An extension process for the 2025 requirements to reduce copper to 0.5%. Extension requests must:
 - be submitted in writing by either electronic mail or certified mail;
 - include the requested duration for the extension, up to three years;
 - provide documentation that supports the need for an extension based on Health and Safety Code section 25250.54; and
 - be processed in accordance with the requirements in Health and Safety Code section 25250.54.

Name of Public Agency Approving Project: Department of Toxic Substances Control

Name of Person or Agency Carrying Out Project: Department of Toxic Substances Control

Exemption Status: (check one)

- ☐ Ministerial [PRC, Sec. 21080(b)(1); CCR, Sec. 15268]
☐ Declared Emergency [PRC, Sec. 21080(b)(3); CCR, Sec. 15269(a)]
☐ Emergency Project [PRC, Sec. 21080(b)(4); CCR, Sec. 15269(b)(c)]
☐ Categorical Exemption:
☐ Statutory Exemptions: [State code section number]
☒ General Rule [CCR, Sec. 15061(b)(3)]

Exemption Title:

General Rule: It can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment.

Reasons Why Project is Exempt:

DTSC has determined with certainty that there is no possibility that the activity in question may have a significant effect on the environment because the project would not result in "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."

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